HiTAPS

**Hi**gh **T**emperature **A**utomobile **P**rotection **S**ystem

Patrick Boodram, Tony Brown, Richard McNeilly, & Malika Mohammed

University of Houston: College of Technology

Advisor: Dr. Attarzadeh

HiTAPS: Product Objective

- Successfully design a **Hi**gh **T**emperature **A**utomobile **P**rotection **S**ystem
- HiTAPS is a notification system that alerts the owner of an automobile of the internal vehicle temperature when it becomes unsafe to a person or animal.
- HiTAPS will help save lives.
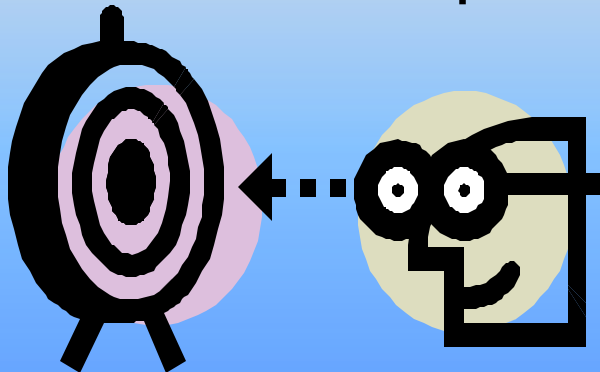
How does HiTAPS work?

- Child or pet is left in a car
- Temperature increases to a dangerous level
- Sensors will detect temperature, pressure and motion in the car
- HiTAPS alerts the owner
- No response from owner; car windows open slightly to let air in
- Horn sounds to alert spectators

HiTAPS: Background Information

- When temperature is 93⁰F outside, inside a car it can be 125⁰F. Temperatures above 100⁰F are deadly, especially to children.
- This is an alarming problem, every summer 25+ children die.
- The current solutions are:
  - education through
    - websites (www.kidsandcars.org, hospitals)
    - concerned car companies like General Motors
  - and a patent
    - for child detection alarm system

"Child Alert Alarm For Automobiles" (Patent #5,966,070)

- By Carolyn M. Thornton of Louisville, KY

- Her system uses two temperature-detecting circuits. One detects heat temperature and the other detects a cold temperature.

- Uses basic logic gates along with relays, transistors, and thermistors.

- Activated as soon as the car is turned off.

- System would go off, but without a response from the driver in a timely manner, the child can become greatly endangered by the increasing heat of temperature in the car.

HiTAPS: Block Diagram

Temperature

CPU

Door Switch

Car Window

Pressure Mat

Microcontroller

Horn

Seat Belt

Receiver   Transmitter

Motion Detector

6
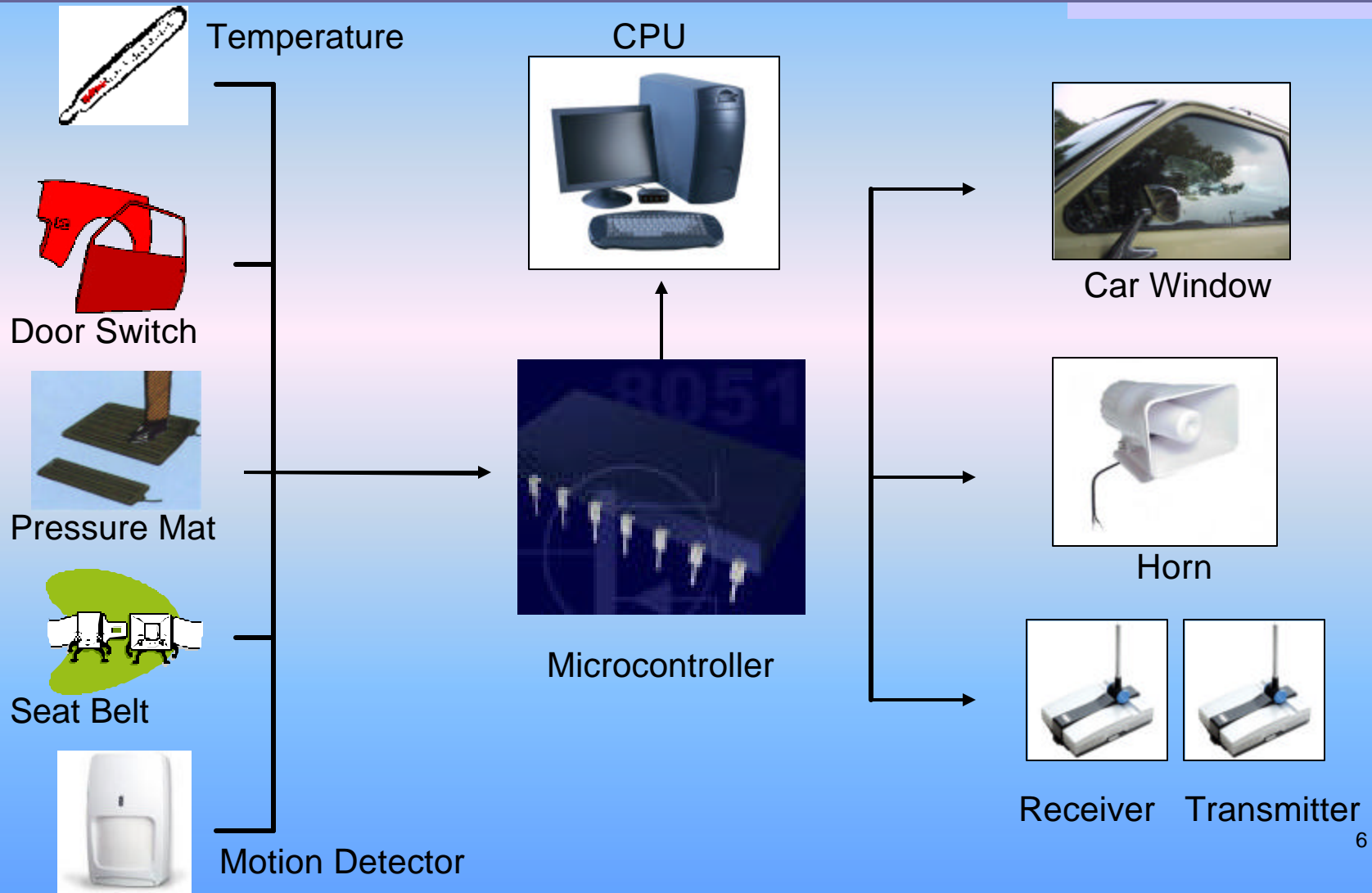
HiTAPS: Interfacing Circuit

HiTAPS: Analog Devices

HiTAPS
Analog Connections with the
PIC16F818 ADC on BiPOM
MM51C2 Microcontroller
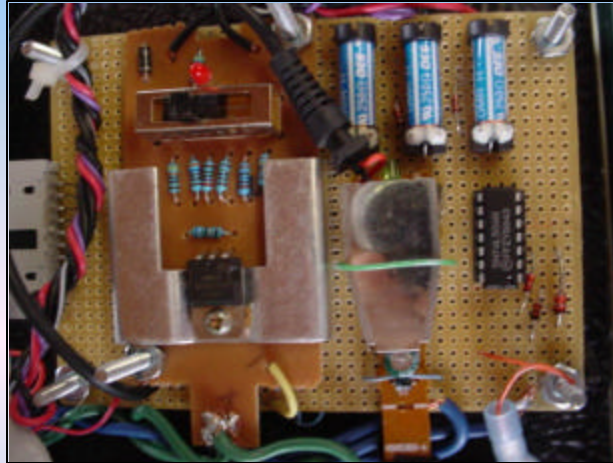Board
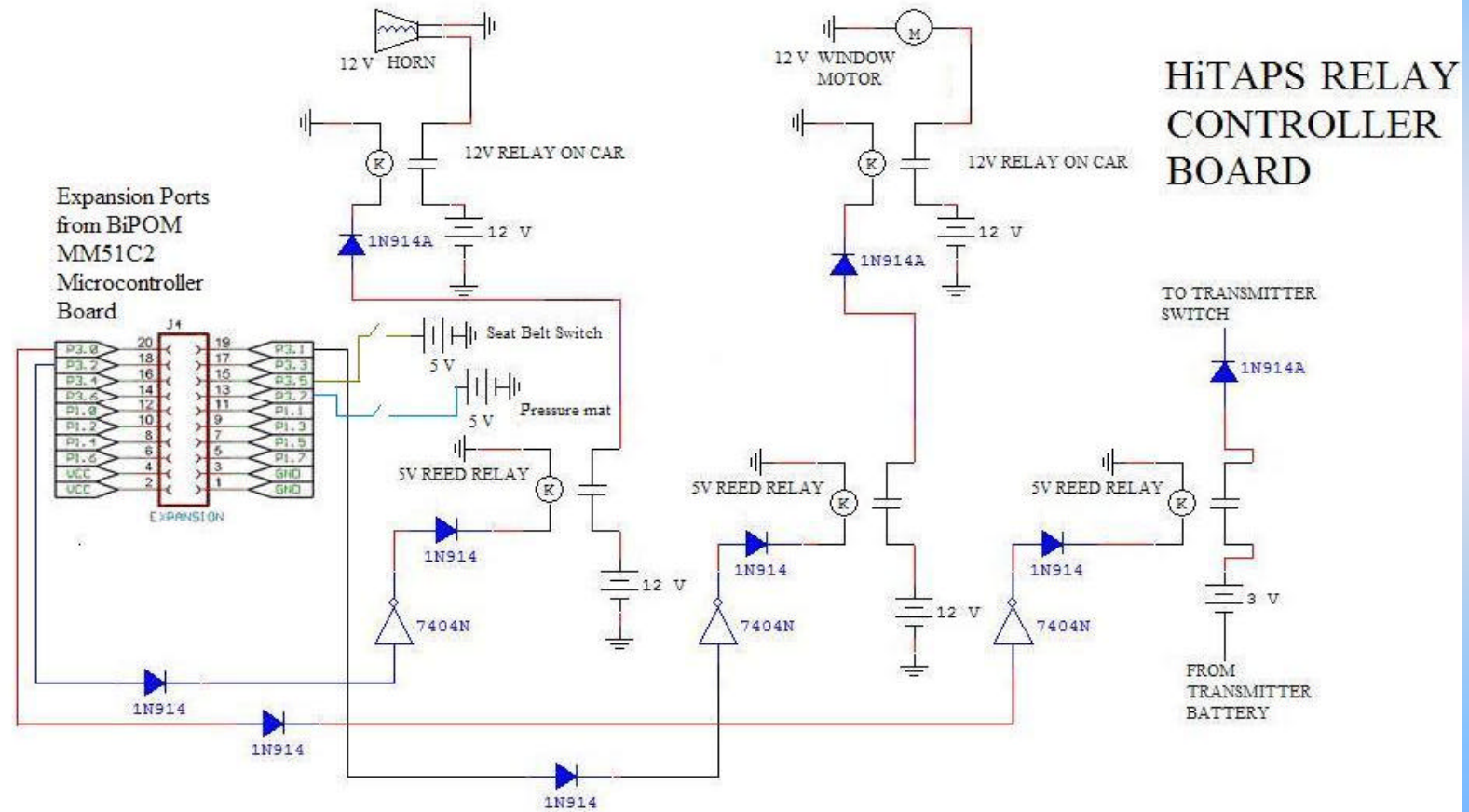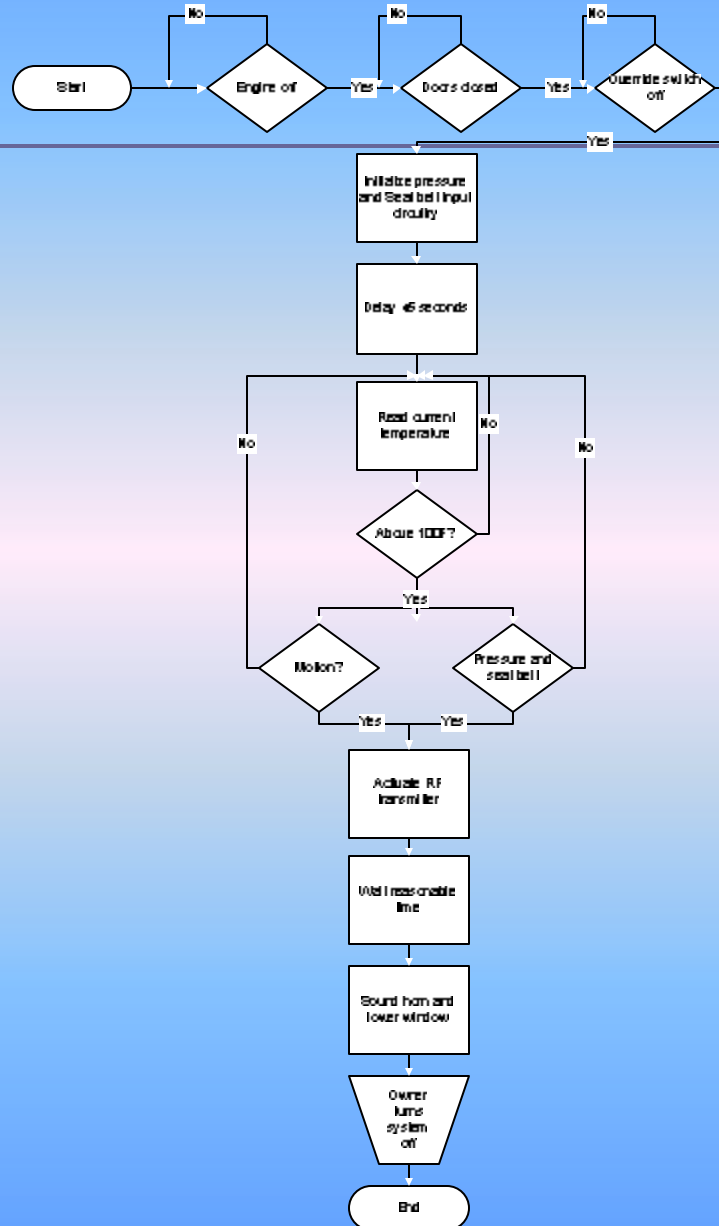
HiTAPS: Pictures

Relay controller Board
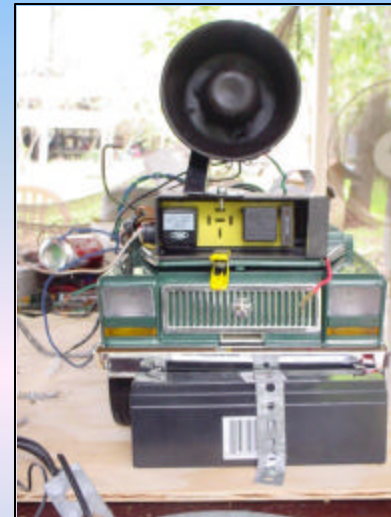
The Alarm Horn, 12V Battery and 12V relay box from a 91 Ford car.

The Relay controller board that controls the Relays on a Car.

Car window rail

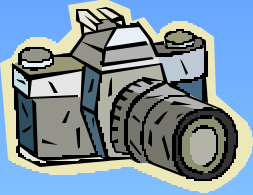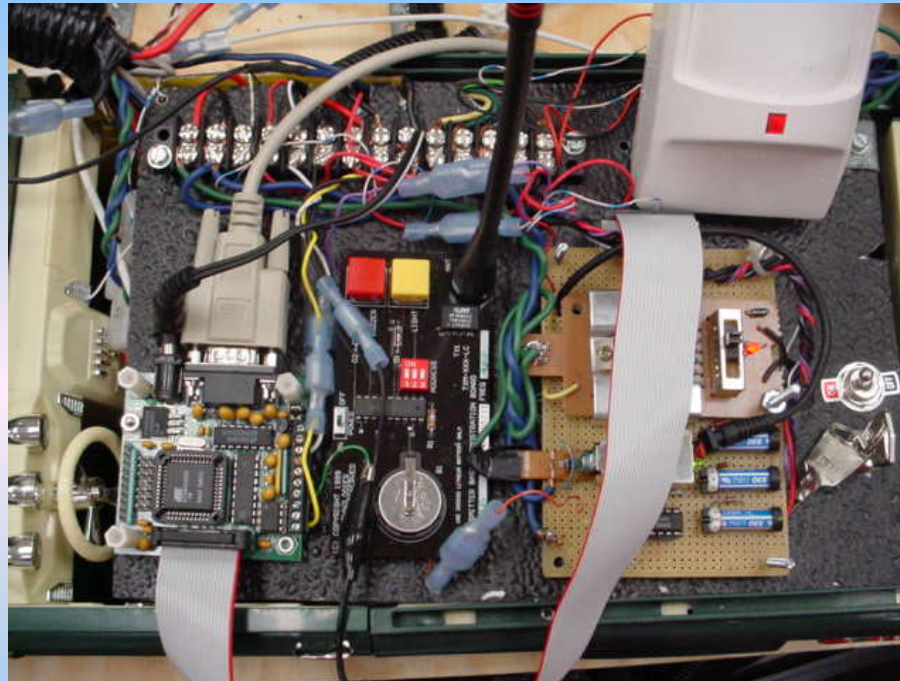**Pressure Mat**

This is the car window rail from a 97 Nissan Sentra and the Pressure Mat.

HiTAPS: Pictures

BiPOM 8051 Microcontroller Board   **R/F Transmitter**   **Motion Detector & Relay Controller Board**
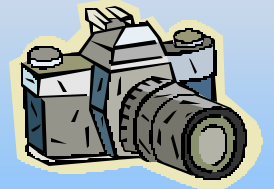
These are the circuits for HiTAPS.

HiTAPS: Pictures

Beginning of the installation
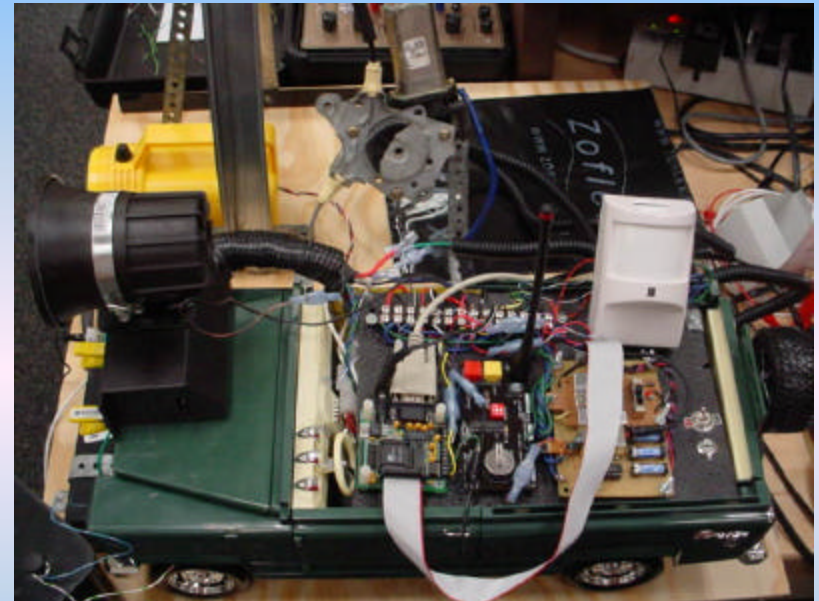
The Final Product

The installation of the HiTAPS circuit into the car.

HiTAPS: Future Improvements

- Accommodating for sleeping child in backseat
  - Body heat detector
- More efficient methods of emergency cooling
  - Integrate the system with the automobile's air-conditioning system
- Using the system to monitor other items within the automobile
- Allow the automobile owner to select the desired critical temperature for the system

HiTAPS:
Constraints & Problems

- Locating the appropriate parts like the pressure mat, RF transmitter & receiver because these items had to be purchased from certain venders

- Learning how to use the microcontroller with the software

- Faulty Parts – the RF transmitter & receiver stopped working 2 weeks before deadline

- Since there are many parts to the circuit, making sure all wires and parts were connected correctly

- There was many hours spent troubleshooting because it would work once and then stop working!

HiTAPS: Expense Report

Equipment	# of items	Price per item ($)	Total price ($)
Motion Detector Kit	1	$19.95	$19.95
Microcontroller	1	FREE	FREE
Temperature Sensors	3	$1.95	$5.85
Motion Detector	1	$18.85	$18.85
Flash Light Case	1	$2.00	$2.00
DC Adapter	1	$9.95	$9.95
20-Pin Ribbon Cable	1	$1.50	$5.75
3V Batter	2	$3.00	$6.00
12V Battery	2	$12.95	$25.90
20-Pin Ribbon Connector	1	$1.00	$1.00
Truck Display	1	$37.88	$37.88
Key Switch	1	$3.95	$3.95
RF Transmitter & Receiver	1	$144.22	$144.22
Pressure Mat	1	$33.15	$33.15
Total			**$317.45**

HiTAPS: Dream Salary

- Group
  - $20hr per person

- 15hrs week

- 11 weeks

- Salary $8250.00 per person

HiTAPS: Projected Timeline

Projected Project Timeline

10/17/2004 - 10/24/2004
Module Testing

10/28/2004 - 11/14/2004
Project Testing

9/22/2004 - 10/1/2004
Design Project

9/14/2004 - 9/22/2004
Brainstorm Project

10/1/2004

11/1/2004

9/14/2004

11/14/2004

10/1/2004 - 10/21/2004
Build and Acquire Project Modules

10/24/2004 - 10/28/2004
Combine Modules

11/14/2004
Project completed
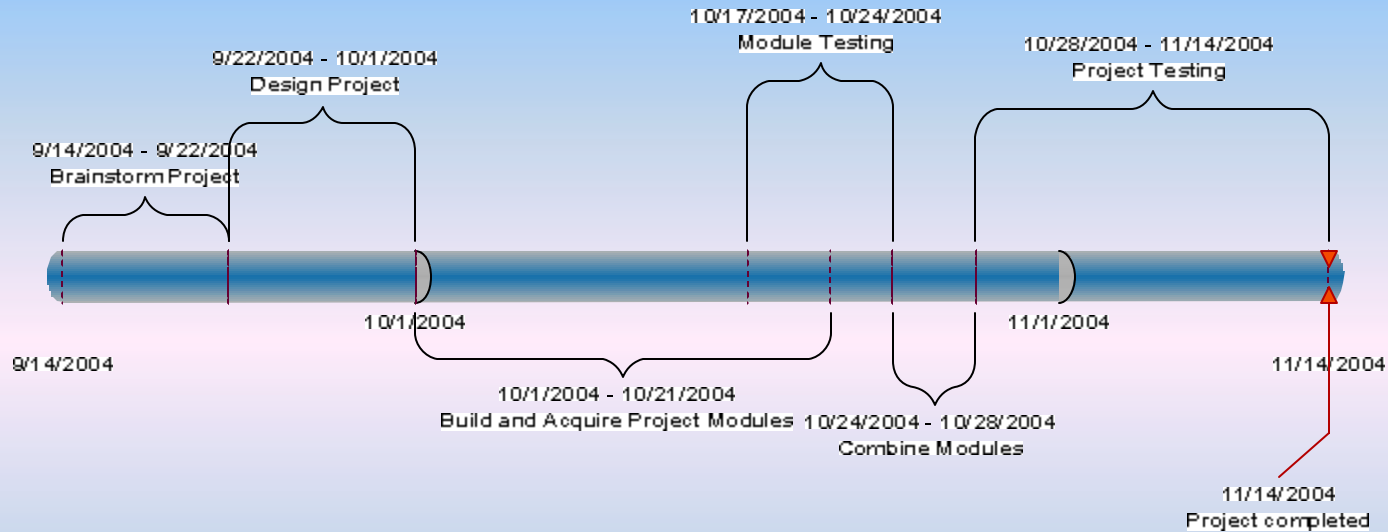
Actual Project Timeline

11/23/2004 - 11/30/2004
Project Testing

9/9/2004 - 9/22/2004
Brainstorm project

9/22/2004 - 10/8/2004
Design Project

10/5/2004 - 11/4/2004
Build and Acquire Project Modules

11/4/2004 - 11/23/2004
Combine Modules

10/1/2004

11/1/2004

9/14/2004

11/30/2004   11/30/2004
Project Completed
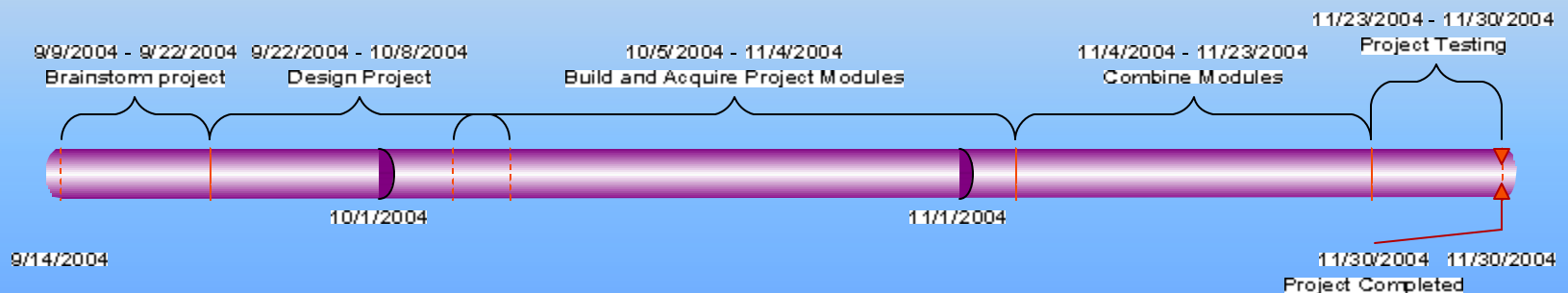
HiTAPS: Work Cited

www.kidsandcars.org

www.colbypitbull.com

www.childrenshospital.com

www.klas-tv.com

 www.gm.com

Patent information:

http://patft.uspto.gov/netahtml/srchnum.htm

http://www.digikey.com

http://www.Jameco.com

HiTAPS: Questions

It's QUESTION TIME!!